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ABSTRACT

Both humanity and nature have suffered greatly from human insensitivity. Not only are the natural resources of the earth being depleted and its air, land and water polluted, the financial resources of humanity are being wasted on destructive expenditures. The "Our Only Earth" series is an integrated science, language arts, and social studies problem solving program for grades 4-12 that addresses six different global issues. The units are designed to provide students with knowledge and skills to address these major global issues actively. The unit presented in this document addresses the problems associated with the global effects of endangered species and their chances for survival. The document includes information to assist teachers in organizing and directing students in their activities. This teacher's guide includes a unit overview, instructions on how to collect information through letter writing (including addresses for appropriate organizations), four classroom activities, a set of fact cards, instructions for a scavenger hunt, instructions for a geography activity, instructions for research and independent study, and materials for a youth summit on endangered species. Additional materials included in this packet are a discussion and chart of instructional techniques and thinking skills used in the unit, a glossary of terms and a bibliography of 39 books, articles, other resources, and games on endangered species. (CW)

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OUR ONLY EARTH SERIES

Endangered Species:

Their Struggle to Survive

A CURRICULUM FOR
GLOBAL PROBLEM SOLVING.

ONE OF A SERIES.

ZEPHYR PRESS

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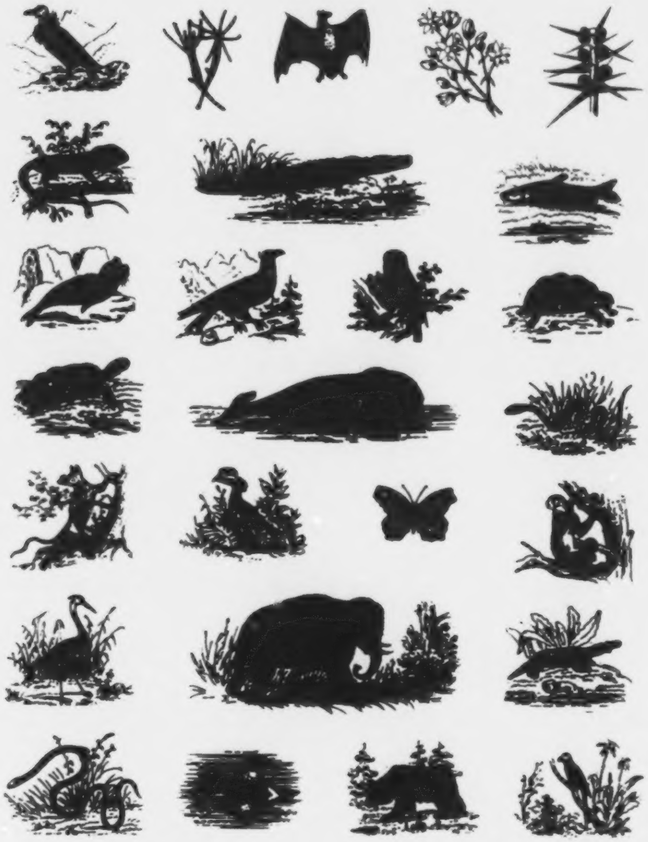
OUR ONLY EARTH SERIES

A CURRICULUM FOR GLOBAL PROBLEM SOLVING

Endangered Species:

Their Struggle to Survive



An integrated curriculum that explores real life issues, culminating with a SUMMIT where students seek solutions to global problems and create action plans. This versatile program is ideal for grades 4th–12th, or as a format for community and regional forums.

Our Troubled Skies
The Future of Our Tropical Rainforests
Our Divided World: Poverty, Hunger & Overpopulation
War: The Global Battlefield
Endangered Species: Their Struggle to Survive
The Ocean Crisis

By MICKI McKISSON and LINDA MacRAE-CAMPBELL

OUR ONLY EARTH

A CURRICULUM FOR GLOBAL PROBLEM SOLVING

Endangered Species:

Their Struggle to Survive

- One in a Series of Six Non-Sequential Units
- For Grades 4-12 • Small or Large Groups
- One Month to One Year Course of Study
- Each Unit Follows the Same Format

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The Future of Our Tropical Rainforests
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Zephyr Press • Tucson, Arizona

By MICKI McKISSON and LINDA MacRAE-CAMPBELL

"Death is one thing. An end to birth is something else."
Dr. Soule and Dr. Wilcox

Endangered Species: Their Struggle to Survive
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We especially appreciate the support and encouragement of our families and friends throughout the creation of these materials. We also want to acknowledge the efforts of people around the world who are seeking ways to appropriately care for humanity and for our only Earth.

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Note: Every *teacher information* section gives an explanation to the corresponding reproducible student activity.

Our Only Earth Series

The Chinese ideograph for the word *crisis* is made up of two words: danger and opportunity. Currently, there are many threatening global issues and diverse opinions as to how to address them. For example, Noel Brown, director of the United Nations Environmental Program, urges immediate action, stating that the earth has approximately 4000 days before it is irreparably polluted. Another view, held by physicist and author F. David Peat, states that individuals need to learn to think systemically and reflectively before taking action.

It should be noted that the intent of the *Our Only Earth* materials is to provide students with knowledge and skills to actively address major global issues. We feel that exciting opportunities exist for resolving pressing social and environmental problems when students are educated about real-life issues, have the tools to address them, and have the desire to act to improve the lives of others and the health of the planet.

Humanity and the environment have suffered greatly from our own insensitivity. To insure our survival and the survival of all forms of life, it is necessary to establish an ethical relationship with others and the planet we share.

Our Only Earth is an integrated science, language arts, and social studies problem-solving program consisting of eight classroom activities. Each of the units in the series follows the same format. These activities can extend from one month of study to an on-going year-long process. Students enthusiastically embrace the lessons because the instructional strategies are so varied and appeal to learners of all ages and types.

Students enjoy the *Our Only Earth* series also because real-life issues are addressed and solutions proposed. This program provides information which is aimed at strengthening students' skills, enabling them to contribute positively to their world.

Introduction

Both humanity and Mother Earth have suffered greatly from human insensitivity. Not only are we rapidly depleting the planet's resources and polluting its air, land, and water, we also waste our financial resources on destructive expenditures. Current global trends reveal the unhealthiness of our planet and our priorities:

- According to Dr. Norman Myers, one species a day is becoming extinct. This rate is expected to accelerate to one species every 15 minutes by the year 2000.
- Myers also states that every year 40 million people die from starvation and hunger-related diseases, half of them children. This is equivalent to more than 300 jumbo jet crashes every day.
- Tropical rain forests comprise only 8% of the earth's surface but contain 40% to 50% of all known species of life. Tropical forests play an important role in regulating global climate and provide an abundance of resources to all of humanity. Yet, according to Walter Corson, if present trends continue, most of the world's tropical forests will be gone by the year 2000.
- Scientists predict that various forms of air pollution may cause global temperatures to rise, the oceans to expand and flood coastal lowlands, interrupting natural food chains, and cause widespread skin cancer among humans.
- According to Lester Brown, in 1988 the world spent more than $100 million each hour on global military expenditures.
- A 1988 article in *Nature Scope* explains that every year fourteen billion pounds of trash are dumped into the oceans. Oil spills, industrial waste, agricultural chemicals, and human pollution relentlessly choke our oceans and marine life.

These statistics are frightening and depressing. When we first began to develop this global education program, we were shocked at the dilapidating state of our planet. We grew apprehensive over the increasing potential for devastation were these problems allowed to escalate. All in all, the prospects seemed dim. Yet, in watching students tackle these monumental global issues—overwhelming to us—our hope was restored. Students, fourth through twelfth grade, once acquainted with this program, developed solid action plans addressing the major global challenges of today.

A few of the students' recent solutions include:

- creating an Animal Congress for animal rights.
- drafting the *Youth Declaration for the Future* which requests that governmental priority be given to global issues
- writing letters protesting deforestation
- adopting a humpback whale
- developing church, school, and community forums
- writing letters to newspapers about global concerns
- picking up litter at parks and beaches

Our fears were quelled by hope as students grew confident in their ability to make a difference in their world, for their world. A seventh grade girl named Emma Wilson stated:

> *"These problems have been left to us. We are the ones who will make a difference. We are the future and we do care."*

Your students will also gain knowledge about a particular area of global concern; they will learn a problem-solving process that addresses an issue of great magnitude and ideally, they will be roused to action. The legacy of a polluted environment with crippling social problems will be inherited by our students, who, with help from the *Our Only Earth* series, will gain the knowledge, skills, and hopefully, the desire to appropriately care for our Earth. All kingdoms of life will benefit.

Note: Sources for the facts mentioned on the previous page can be found in the bibliography.

Various Instructional Techniques

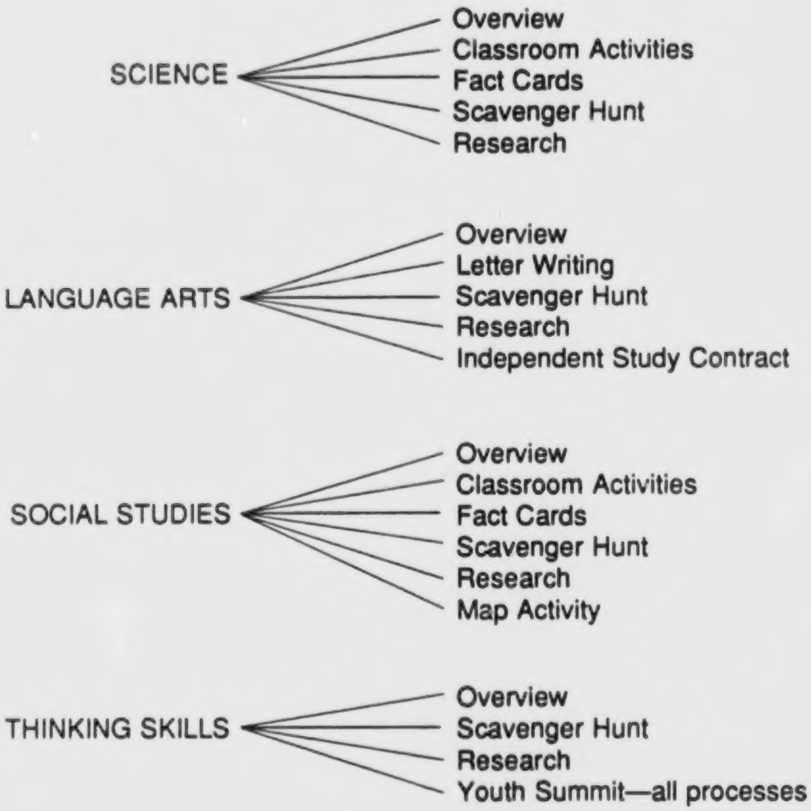
Not only are the global topics timely and important, but they will incite enthusiasm in your students. The activities, developed by award-winning teachers and field-tested by elementary and secondary students, are first and foremost FUN! Students will enjoy the dynamic and varied learning activities. You, as the instructor, will appreciate the care and thoroughness that went into the preparation of these lessons for use in your classroom.

A variety of instructional strategies are used in classroom activities in order to appeal to all types of learners. Several concrete and experiential learning processes engage the bodies, minds, and feelings of students. Kinesthetic, visual, and auditory functions are stimulated to maximize the learning potential of each student. The lessons provide opportunities for them to work independently as well as cooperatively in small and large groups. Critical and creative thinking skills are incorporated into the activities to engage students in higher levels of thinking. A creative problem-solving stategy is implemented to help students approach the issues at hand. The chart on the following page depicts the variety of instructional strategies and higher level thinking skills which are included in *Our Only Earth* activities.

INSTRUCTIONAL STRATEGIES & THINKING SKILLS IN *OUR ONLY EARTH*

	Overview	Letter Writing	Classroom Activities	Accelerated, Cooperative Learning: Nothing but the Facts	Scavenger Hunt	Where in the World Map Activity	Self-Directed Learning	Global Problem Solving: The Summit
Learning-to-Learn Skills	X	X			X	X	X	X
Memory Skills	X			X				X
Kinesthetic Activites			X	X	X		X	X
Visual Activities	X		X	X	X	X	X	X
Creative Thinking Skills	X		X	X	X		X	X
Critical Thinking Skills	X	X	X	X	X	X	X	X
Problem Solving		X		X	X	X	X	X
Cooperative Learning	X			X	X	X		X
Research Skills	X	X	X	X	X	X	X	X
Communication Skills	X	X		X	X	X	X	X
Engaging Feelings	X		X					X

In addition to a variety of instructional strategies, the enclosed lessons also provide an integrated learning experience which incorporates science, language arts, social studies, and thinking skills. The following chart shows the integration between subject matter and lessons and activities of *Our Only Earth:*



The Sequence of Our Only Earth

Our Only Earth has been carefully structured for both the student and the teacher. Study of the global problem begins with a brief survey, followed by in-depth information and independent research, culminating with a problem-solving process where students conduct their own Youth Summit. At the Summit, the students search for solutions and create action plans to approach the global issues.

In the Teacher's Guide, you'll note explanations for each student activity. The lessons in *Our Only Earth* are intended to be used as guidelines. Your creativity is encouraged, so please use these materials as a springboard for developing your own classroom activities.

The Overview

The students begin with an Overview of the issue. The Overview serves as a quick appraisal of the global issue and discloses important facts as to WHY this topic is worthy of study. Since the Overview shares poignant information, the students often become emotionally engaged in the topic. If students feel overwhelmed or fearful, as we initially did, reinforce the point of studying this issue—to improve environmental or social conditions. To do this, it is necessary to be informed.

Letter Writing

Next, students will write letters to organizations requesting information about the particular global problem at hand. This activity serves two main purposes: to introduce students to formal letter writing, and to provide them with up-to-date information on the topic.

Classroom Activities

Students, as a class, will then have hands-on experience to personally explore aspects of the global issue. Because of the experiential nature of these activities, the students should be motivated to study further for the next activity.

Nothing But The Facts!

This is a cooperative and accelerated learning activity that teaches facts and information about global problems. Students are divided into small groups. Everyone receives a fact card and teaches the three facts on the card to their group. Next, the group prepares a dynamic mini-presentation to teach their facts to the whole class. When this lesson is complete, the students will have learned a wealth of information about their global challenge.

Scavenger Hunt

Prepare for your students to go wild with excitement over this activity! The students will be gathering additional information on their topic through a scavenger hunt method. Again, the students will work in small groups and then share the data they have gathered with the whole class.

Where In The World.........?

This is an enjoyable map activity. Students locate acute problem spots on a world map, pinpoint the coordinates, and identify the regional areas involved.

Research and Independent Study Contract

Now that your students have gathered an abundance of information, they are ready to identify one aspect of the problem and pursue it through independent research. To help facilitate this individualized research, each student will complete a contract. You will then be able to log each student's progress, as well as help your class move towards the most valuable type of educational experience—self-directed learning.

The Youth Summit

Here the students will actively meet in groups to share what they have learned, to decide upon a specific problem they want to solve, and to create a plan of action. This problem-solving process is the highlight of the entire unit. At the Summit, students are asked to make positive contributions to the world. Activating the students' plans may, for some, take a short period of time, or in other cases, depending on the particular commitment, may take longer.

As your students progress through *Our Only Earth,* you will undoubtedly notice many significant attitude changes. They grow aware of the delicate global environment we live in. They develop a sense of responsibility towards others. Often there is a commitment to become a caretaker for the planet. Here is what some students have to say after participating in *Our Only Earth* Programs:

"We are the ones doing this to ourselves and we can learn to stop."
Sue Ann Martin, age 11

"I learned that I am not the only one out there who cares and that I have something to do for this polluted but wonderful world."
Misty Vichitnand, age 12

"After studying these problems, I learned to be more caring for the world. I see that we can be world changers."
Jason Schmidt, age 9

Note: As you photocopy activities for your students, remember that copier paper can be recycled too!

1 The Overview

Suggested Activities for the Global Issue Overview

(approximate time: 1 hour)

The Overview contains interesting information on your global challenge and will ready students for more in-depth information. The intent of the Overview is to provide your class with a quick survey of the main issues while piquing their curiosity and their desire to learn more.

One way to introduce students to the Overview is to first have them quickly brainstorm what they already know about the topic. They can do this individually or as a group. You may want to list or chart their information on the blackboard. Another option would be to list the information on an overhead sheet or on a piece of butcher paper so that students can refer back to their original suggestions and then add new information when needed.

Copies of the Overview are distributed after the discussion. Suggest your class read silently through the material once to pick up general information. For the second reading, have students note at least three facts that are particularly interesting to them. Ask the students to prepare to teach these three facts to a small group of students or to the whole class. Suggest they make visuals, a riddle, or a short poem to help teach the others. Give the students about fifteen minutes to prepare.

After the students have shared their three facts, ask the class for additional questions they might have about the global issue. You may want to suggest they consider questions asking **who, what, where, when, why and how.** As the students begin to share their questions, you may want to list them on the board or on a piece of butcher paper for future reference. Later, as the students progress through their studies, they may want to note answers they have found to their questions.

Overview of Endangered Species

The earth is home to a multitude of plants and animals. Over many thousands of years, humans have become the most powerful living beings on earth even though we comprise less than one half of one percent of all known lifeforms on the planet. Everywhere that we have gone, entire species of birds, mammals, reptiles, fish and other forms of life have been destroyed. Our need for housing, fuel, land and materials has taken precedence over the needs of plants and animals.

Scientists estimate that between 10 to 80 million species of life exist on earth. If we continue our present relationship with wildlife, it is predicted that we could destroy half of the world's species in the next 100 years. Many of the disappearing plants and animals have not yet been studied or classified—we are unaware of the potential benefits to humanity as well as the role they play in the earth's giant web of life.

There are four major reasons why plants and animals become endangered or extinct. These include:

- DESTRUCTION OF HABITATS: Plant and animal habitats are altered and destroyed every time forests are cleared, marshes are drained, or deserts are irrigated. These practices result in the loss of natural components in our ecosystems.

- OVERHUNTING: Over 400 species have become extinct in the last 400 years due to overhunting. The hardest hit animals are the slow breeding, long living species. Once, over 100,000 blue whales inhabited the oceans. Today, only a few thousand exist and their futures are threatened.

- POLLUTION: Toxic substances in the environment like gases and particles caused by engine exhaust, industrial wastes, and chemical sprays destroy plants and animals.

- INTRODUCING NEW SPECIES INTO A FOREIGN ENVIRONMENT: Frequently, when species are placed into a new environment they threaten the native wildlife since the native plants and animals lack methods to protect themselves from the intruders.

Human beings are beginning to learn how interconnected all life forms are on earth. We depend on other species to produce the oxygen we breathe, absorb the carbon dioxide we exhale, decompose our sewage, provide our food and maintain the fertility of our soil. It's important that we limit the threat that we impose on other species or else, as some scientists suggest, we may find our own life threatened. Humans, as the most powerful living beings on earth, have the greatest responsibility to ensure that the rich diversity of life on our planet continues to flourish.

2 Letter Writing

Writing to Organizations for Information

(approximate time: 1 hour)

In order to gather current information on the global challenge, you will want to initiate a letter-writing activity to various organizations at the beginning of the unit. It often takes four to six weeks to receive information. However, the wait is well worth it, as the materials will provide relevant and up-to-date information. For a quicker response, depending upon your locality, you can also call organizations and ask them to send information.

To introduce this letter-writing activity, ask the class to consider questions they have about the issue at hand. Explain that writing letters to public and private organizations is an effective way of gathering information on a topic where data is continually changing.

Begin by providing students with copies of "Organizations to Write to for Information." Brainstorm with them about what elements to include in a letter that requests information. Assign groups, pairs, or individual students to contact an organization. You may want to suggest that they create an outline before writing. It's important for students to be specific in their requests for materials. Depending upon the age and ability level of your students, you may wish to format a sample letter.

Expect an abundance of information from these organizations.

Organizations to Write to for Information on Endangered Species

AMERICAN CETACEAN SOCIETY
P.O. Box 2639
San Pedro, CA 90731
(213) 548-6279

AMERICAN COMMITTEE FOR INTERNATIONAL CONSERVATION
(Wildlife Conservation)
c/o Roger McManus, Center for Marine Conservation
1725 DeSales Street, N.W., Suite 500
Washington, DC 20036
(202) 783-7800

CLEAN WATER ACTION PROJECT
317 Pennsylvania Avenue, S.E., Suite 200
Washington, DC 20003
(202) 547-1196

THE CONSERVATION FOUNDATION
1250 24th Street, N.W.
Washington, DC 20037
(202) 293-4800

DEFENDERS OF WILDLIFE
1244 19th Street, N.W.
Washington, DC 20036
(202) 659-9510

FRIENDS OF THE EARTH
218 D Street, S.E.
Washington, DC 20003
(202) 544-2600

Note: Because these organizations may move before our annual Spring update, please see the *Encyclopedia of Associations* for the most current addresses.

FUND FOR ANIMALS
200 W. 57th Street
New York, NY 10019
(212) 246-2096

GLOBAL TOMORROW COALITION
1325 G Street, N.W., Suite 915
Washington, DC 20005-3104
(202) 628-4016

GREENPEACE USA
1436 U Street, N.W.
Washington, DC 20009
(202) 462-1177

NATIONAL PARKS AND CONSERVATION ASSOCIATION
1015 31st Street, N.W., Suite 400
Washington, DC 20007
(202) 265-2717

NATIONAL WILDLIFE FEDERATION
1400 16th Street, N.W.
Washington, DC 20036-2266
(202) 797-6800

NATURE CONSERVANCY
1815 N. Lynn Street
Arlington, VA 22209
(703) 841-5300

RAINFOREST ACTION NETWORK
301 Broadway, Suite A
San Francisco, CA 94133
(415) 398-4404

SIERRA CLUB
730 Polk Street
San Francisco, CA 94109
(415) 776-2211

WORLDWATCH INSTITUTE
1776 Massachusetts Avenue, N.W.
Washington, DC 20036
(202) 452-1999

3 Classroom Activities:

Understanding the Global Issue of Endangered Species

In order to help your students understand the global issue of endangered species, you may want to do one or more of the following activities with your class.

1. Understanding Habitat Destruction

The teacher should initially locate two environments on or near school grounds. One should be undisturbed and the other should show evidence of humans such as paths for walks. Organize students into small groups of four to six, take them to the two environments and have them observe each plot as well as record any signs of animals and insects. Plants can also be recorded through quick drawings or through a written description of their characteristics. Encourage the students to also take note of the soil, describing or drawing its texture and composition.

Once students have gathered data about the two environments, ask them to compare their findings. Have them note the differences and similarities between the environments and draw three conclusions about the impact humans have on the habitats of plant and animal species. The following observation sheet may be used by students to record their findings.

Observation Sheet

General Description or Illustration of the Plot:

☐ disturbed ☐ undisturbed

Signs of Wildlife:

Animals and insects observed:

Plants:

Soil:

Illustrations of Plants, insects, animals, soil:
(Use back of page or new sheet of paper if necessary.)

Conclusions about the disturbed and undisturbed environments:

2. Interdependence

There are approximately 25,000 species of plants threatened with extinction. For every plant species there are about 20 to 40 animal species dependent on those plants for survival.

Ask students to identify one local plant species. Ask them to find out how humans, animals and insects depend upon this plant for their survival. Have students create a diagram or drawing that shows how animals and insects depend upon this plant for food and habitat.

3. Endangered Animals

Have available a variety of magazines with pictures of wildlife. Ask students to cut out pictures of animals that are threatened or endangered and create a collage. Follow-up by having students write a poem, story or song about the plight of the ones endangered.

Another activity is "Endangered Species Animal Rummy." This card game quickly introduces students to endangered animals, their habitats, lifespan and other information. The card games are available in some educational supply stores or can be ordered through Safari Limited, P.O. Box 630 685, Ojus, Florida 33163, or by calling (305) 895-1444.

4. Ecosystems

As a class, brainstorm a variety of ecosystems such as wetlands, deserts, coral reefs, etc. Assign an ecosystem to each group of students to research. Ask them to find out the types of plant, insect and animal species that make up this ecosystem. Have students list the species and their major contribution to the ecosystem. In addition, have them show how the different species depend on each other for survival. This is best illustrated in a diagram that shows the interdependence of the different species in the ecosystem.

Once students have researched the role of at least four different species in a given ecosystem, ask them to create a skit that shows how each of these species work together to keep the ecosystem healthy and balanced. In addition, students can choose one of the categories of problems affecting wildlife (habitat destruction, pollution, overhunting, or introduction of new species) and show in their skit what happens to the ecosystem when confronted with one or more of these problems.

4 Fact Cards

Cooperative Learning With Fact Cards

On the following pages you will find fact cards about your global issue. What follows is a description of a cooperative learning activity that will, in one or two hours, introduce your students to a number of facts. Not only will the students cooperatively learn from each other, they will be exposed to a vast amount of material from this activity.

You will note that there are four categories of fact cards, each category with a total of eight cards, 32 in all. Divide your class into four groups of approximately eight students in each, or if you'd rather, divide them into approximately eight groups of four students each. Each group is then assigned one of the four categories to study.

After the categories are assigned and the student groups are physically arranged, each group then receives cards from one of the four categories. Each student takes one card which contains three facts. Students are then responsible for completing the following activities:

- Read the three facts on the cards. (approx. 5 minutes)
- Teach group members their three facts. (approx. 5-10 minutes)
- Learn the facts from the other group members. (approx. 5-10 minutes)
- Decide, as a group, on 8-14 facts to teach the rest of the class by preparing a class presentation. (approx. 20-30 minutes)
- Teach the group's facts to the other groups in the classroom so that all may learn from each other. (approx. 30-60 minutes)

When the students are teaching their facts to their own group and then to the rest of the class, they should be encouraged to be creative and interesting in their instruction. Inform the students that they can teach with the following methods:

- visuals, charts, diagrams
- poems, songs, or stories
- role play, games, or skits
- question-and-answer or riddle formats
- charades
- invent their own creative teaching strategies

Suggest to the students that they teach in ways that enable others to really learn the information, not just listen and forget!

When students are placed into their groups, some may wish to study another category. You can explain that when the activity is completed, everyone in the class will have learned about ALL of the topics. So even if they don't have their first choice, they will still have an opportunity to learn what interests them.

Age and Class Size Adjustment

It is easy to adjust the fact-card activity to fit a variety of age groups as well as a larger or smaller number of students. For fourth- through sixth-grade students, you may want to have them learn only one or two facts per card, then each group could teach fewer facts to the entire class. If you have fewer than 32 students, ask for volunteers who are willing to learn more than one card.

Evaluation of the Activity

Evaluation can occur in a variety of ways throughout this activity. Observing how students teach one another will indicate what was learned individually. Having the students list, draw, or reenact what they gleaned from their classmates will also demonstrate their knowledge. At the end of the presentations, you may want to ask students to list on paper at least ten facts they have learned.

Nothing but the Facts

ENDANGERED SPECIES GENERAL INFORMATION:

1. No one knows for sure how many diverse species live on earth. Scientists estimate the total number to be anywhere from 10 million to 80 million species of plants and animals.

2. Scientists have only classified about 1,700,000 plant and animal species of the total number of species that live on earth.

3. Some plants and insects vanish before being discovered, classified or studied. With those vanishing species goes their secrets about how they contribute to the world's ecosystems along with any potential benefits they may have contributed to humankind.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Since the beginning of life on earth, many species of plants and animals have naturally become extinct.

2. Natural extinction occurred because the species was unable to survive in their environment or because they evolved into another life form.

3. In the past, extinction was primarily caused by climatic and geophysical factors. Today, extinction is mostly a human created condition.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Some scientists forecast that by the end of the twentieth century one million species will vanish from the earth. However, predictions of this kind are difficult to determine since we don't know exactly how many species exist on earth.

2. If the prediction of one million is accurate, that would be more than all of the natural extinctions that have occurred during the earth's geological history, including the dinosaurs.

3. It is estimated that as many as 50,000 species could be lost a year by the year 2000 due to habitat destruction, pollution, overhunting or the introduction of a new species to a habitat.

ENDANGERED SPECIES GENERAL INFORMATION:

1. On earth, there is incredible diversity. From existing surveys, we know that insects and plants together account for four out of five species identified so far. Mammals, including humans, comprise just three-tenths of one percent of all known organisms.

2. There are an estimated 30 million different species of insects or 34 undiscovered insects for every one known. 10% to 40% of all the flowering plants and 10% of the fish have yet to be discovered.

3. The diversity of plants and animals (biological diversity) is one of the earth's most precious resources. Each different species makes important contributions to maintaining a balanced and healthy ecosystem.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Plants in all parts of the world are threatened. Plants contribute to the air we breathe, the water we drink and the soil we grow food in. They also serve other functions that are vital to maintaining a balanced ecosystem.

2. Plants are essential to many of our biological processes. Green leaves absorb carbon dioxide and release oxygen. Stream flows and ground water levels are regulated by the root systems of plants which help in recycling nutrients for the soil and filtering pollutants. In addition, every plant has about 20 to 40 species of insects and animals which depend on it.

3. The extinction of insects would be devastating. Insects play an important role in the ecosystem as pollinators. Most of the important crops in the U.S. are pollinated by insects.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Tropical forests and coral reefs contain the greatest variety of species and will lose the most if these fragile ecosystems are destroyed along with their habitats.

2. Plants and animals in the tropical rainforest are highly interdependent. If a pollinating animal disappears, then so does the plant. When a plant vanishes, the animals that depend on it also suffer.

3. It is predicted that what mostly faces extinction are plants, insects, amphibians, and fish. However, large numbers of birds, reptiles and mammals will also be lost.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Habitat destruction caused by land development, hydroelectric projects, building roads and even war, is the major cause of plant and animal extinction.

2. Over hunting and exploitation of certain species, such as the whale is another cause of extinction. Rhinoceros are killed for their horns and elephants for their tusks. Birds, porpoises and sea turtles are snared in commercial fishing nets.

3. Many species are threatened by pollution. Estuaries and marine areas are damaged by siltation and chemical and petroleum pollution. Pesticides and insecticides used in agriculture affect wildlife populations.

ENDANGERED SPECIES GENERAL INFORMATION:

1. Humans depend on the well-being of plant and animal species. Wild plants and animals provide us with food, medicine, and industrial raw materials. Just twenty plant varieties provide 90% of the world food supply.

2. Over 40% of all prescription drugs contain chemicals that come from wild species. Many of these drugs are used to treat heart disease, Hodgkin's disease and many forms of cancer.

3. Many raw materials come from wild plants and are dependent on other wild species for their development, economic productivity and usefulness. Timber and other wood products such as paper and lumber are important products that come from a living resource.

ENDANGERED SPECIES GEOGRAPHY:

1. Since 1970, the rhinoceros population in Africa has been reduced to only 6,000. The rhinos are being hunted for their horn which is thought to be a potent medicine. A dagger with a rhino horn handle symbolizes power.

2. In North Yemen, young men will pay up to $1,000 for a rhino's horn to use in a ceremonial dagger even though such importing is illegal in North Yemen.

3. The profits are so high for rhino poachers that the hunting still continues. Today, the rhino is endangered due to overhunting.

ENDANGERED SPECIES GEOGRAPHY:

1. Tropical rainforests contain more than two-thirds of all the world's species, yet habitat destruction is a major threat to all forms of life in the tropical rainforests.

2. Tropical rainforests in Latin America provide a winter habitat for migratory birds who breed in the United States.

3. Over the past 40 years there has been a decline in migratory birds that winter in the tropics. This decline is attributed to deforestation.

ENDANGERED SPECIES GEOGRAPHY:

1. Many sea mammal populations are decreasing. The Stellar sea lion in Alaska is endangered. There has been a 63% decline in the sea lion population between the four years of 1985-1989.

2. This decline is occurring in the Bering Sea and the Gulf of Alaska and is in part caused by commercial trawl fisheries.

3. Every year more that 100,000 dolphins are killed in mile-long purse seine nets used by international tuna fleets to catch yellowfin tuna.

ENDANGERED SPECIES GEOGRAPHY:

1. The pesticide DDT was banned in most developed nations during the 1960's and 70's when it was discovered that it caused major problems for wildlife, especially for birds.

2. Developing countries, especially in the tropics, continue to use DDT because it is extremely effective against mosquitos even though it harms wildlife.

3. A $99 million loan given to Brazil by the World Bank will fund the spreading 3,000 tons of DDT across 2 million square miles of the Amazon Basin (nearly the entire basin) in an effort to stop malaria caused by mosquitoes. Scientists are concerned about the impact DDT will have on such a fragile ecosystem.

ENDANGERED SPECIES GEOGRAPHY:

1. In 1970, a survey indicated that there were less than 5,000 tigers left in all of Asia. Forty years ago, an estimated 40,000 tigers lived in India alone.

2. The Caspian and Balinese tigers were extinct by the 1970's. Only five Javan tigers were found and only a few hundred Siberian and Sumatran tigers remained during the 1970's.

3. Today, 11 reserves established by the Indian government have been responsible for increasing the tiger population. In 1985, the tiger population grew to 4,000 from only 1,800 in 1977.

ENDANGERED SPECIES GEOGRAPHY:

1. Madagascar, off the eastern coast of Africa, is the fourth largest island in the world. Fifteen hundred years ago, early explorers found an island entirely covered in forest.

2. Today, four-fifths of the forest has been cleared. Nearly 150,000 hectares of forest are cleared away every year. This habitat destruction is responsible for the loss of a variety of unusual and unique plants, insects, birds and mammals.

3. At one time, three different giant flightless birds, two giant tortoises and 11 species of giant lemurs could be seen in Madagascar. Today they are all extinct.

ENDANGERED SPECIES GEOGRAPHY:

1. In 1971, there were about 1,000 mountain gorillas living in Central Africa.

2. Habitat destruction is the primary cause of the decline of mountain gorillas. As of 1980, only 500 gorillas were found remaining in Central Africa.

3. Mountain gorillas are also hunted and killed and parts of their body sold to wildlife traders.

ENDANGERED SPECIES GEOGRAPHY:

1. There are approximately 25,000 species of plants threatened with extinction.

2. For every plant species there are about 20 to 40 animals dependent on each plant for survival.

3. The Giant Panda, which lives in China, depends on bamboo for its survival. As the bamboo forests disappear, the panda population declines. As of 1980, there were only about 800 pandas left in the wild.

ENDANGERED SPECIES CONCERNS AND CONSEQUENCES:

1. Some scientists predict that before this day ends, 45 kinds of plants and animals will die. In a month, 1,400 species could be lost forever. Within a year, the number of vanished species, including both plants and animals, might total around 17,500.

2. The scientists who provide such estimates say the above totals offer the most hopeful case since the real numbers may prove much higher. Science has not yet identified most of the lifeforms that exist on earth.

3. In the next twenty to thirty years, scientists predict that hundreds of species will be destroyed per day. Biologists warn that we may be on the verge of a mass extinction that could, within the next hundred years, destroy half of the world's species.

ENDANGERED SPECIES CONCERNS AND CONSEQUENCES:

1. While we are able to count some plants and animals that are in danger, there still are huge numbers of **unknown** plants and animals which are also threatened.

2. The earth according to diverse estimates, supports anywhere from 10 to 80 million species. Of these, scientists have only found and named less than two million.

3. Species are disappearing before humans have the opportunity to learn how they might benefit the rest of the planet. Currently, four out of every ten prescription medicines come from ingredients found in plants. Some animals also provide a variety of medicines.

ENDANGERED SPECIES
CONCERNS AND CONSEQUENCES:

1. While it's natural for species to become extinct over millions of years, humans have drastically sped up the process. Everywhere that humans have lived, we have destroyed whole species of birds, mammals, reptiles, fish and other forms of life.

2. People are causing extinction in four main ways. These include destroying wildlife habitats, overhunting, introducing new species that endanger native wildlife and pollution of the environment.

3. When a plant disappears, animals that depend on it directly for food or shelter also suffer. In turn, species that depend on such animals are affected. Since all life on the planet is interconnected, extinction will eventually affect all species in one way or another.

ENDANGERED SPECIES
CONCERNS AND CONSEQUENCES:

1. Overhunting is one of the four leading causes of extinction. Humans kill animals faster than they can reproduce.

2. This is how we have eliminated big animals, from mammoths 10,000 years ago to the California grizzly bears in this century.

3. At the current rate of slaughter, elephants, rhinos, and most other large African and Southeast Asian mammals will be extinct except for the ones that live in zoos.

ENDANGERED SPECIES CONCERNS AND CONSEQUENCES:

1. Another cause of extinction is the placement of species in parts of the world where they didn't previously exist. When wildlife spreads in foreign lands, it often kills off native species which lack defenses against the newcomers.

2. Some examples include a fungus introduced to the U.S. that has nearly exterminated the American chestnut tree. Also, goats and rats introduced on oceanic islands have destroyed many native plants and birds.

3. The Nile perch was introduced in Africa's Lake Victoria to establish a new fishery. The perch is destroying hundreds of fish species and could result in the largest extinction caused by a nonindigenous predator in modern times.

ENDANGERED SPECIES CONCERNS AND CONSEQUENCES:

1. Destruction of habitat is another reason for the growing numbers of endangered species. Most species live in only one type of habitat, such as marsh wrens which live in marshes and pine warblers which live in pine forests. When their habitat is destroyed, the birds are as well.

2. Environmentalists in the Pacific Northwest are working to protect the habitat of the northern spotted owl, now considered a "threatened species." If the owls' nesting areas do gain protection under the Endangered Species Act, then thousands of loggers will lose their jobs and face economic ruin.

3. The fourth reason for the growing numbers of endangered species is pollution. The pollution of our land, air and water poisons wildlife and hinders reproduction.

ENDANGERED SPECIES CAUSES AND CONSEQUENCES:

1. Each mammal, plant or insect that becomes extinct takes genes with it that could have been very valuable. As species disappear, so do their gene pools.

2. Of the world's estimated 80,000 edible plants, only 20 plants provide 90% of our food. Increasing numbers of people depend on a shrinking number of crops.

3. As we narrow the kinds of plants we grow, they become more vulnerable. If these foods are threatened by disease, we may not have the genetic variety to grow healthy strains.

ENDANGERED SPECIES CAUSES AND CONSEQUENCES:

1. Just as we do not yet know all the species on earth, we also do not yet know how extinction will affect life on earth. Since all life depends on other lifeforms, we can not determine which species to preserve and which to let die.

2. Like all species, humans depend on others for survival. We need a variety of species to produce the oxygen we breathe, absorb the carbon dioxide we exhale, decompose our sewage, provide our food and maintain the fertility of our soil.

3. Currently, humans are responsible for endangering wildlife on earth. Hopefully, we will assume greater responsibility for preserving the diversity of life.

ENDANGERED SPECIES SOLUTIONS:

1. In 1973, The United States adopted the Endangered Species Act. This act outlaws disturbing the habitats, hunting or trading of endangered species; but there are many problems with enforcing the act.

2. As little as 100 years ago, treaties were not written to protect wildlife and wildlands. Today, many nations around the world have strategies to conserve wildlife.

3. However, while more and more people recognize the importance of protecting the diversity of life, most governments do not provide enough funding for environmental issues and more monies will need to be given in the future.

ENDANGERED SPECIES SOLUTIONS:

1. Some people recommend creating more laws to increase wildlife conservation. The first kind of law would protect individual species.

2. The second kind of law would protect an entire region, and the third would require worldwide agreements. Such laws have been created, but many more laws may be needed to insure plant and animal protection.

3. One worldwide agreement called CITES, the Convention on International Trade in Endangered Species, has been adopted by over 80 countries and helps to stop the trade in threatened species.

ENDANGERED SPECIES SOLUTIONS:

1. To reduce the number of endangered species, there are local projects that schools can do to help wildlife.

2. One elementary school in New York state is saving the Karner blue butterfly. The larvae eat only one kind of plant, the wild blue lupine, which is vanishing due to housing developments.

3. The school children collect lupine seeds and then plant them to generate new colonies of Karner blues. Other schools or classrooms around the United States have also undertaken efforts to save local wildlife. Hopefully, many more will begin.

ENDANGERED SPECIES SOLUTIONS:

1. Researchers are currently experimenting with ways to restore damaged environments by making them healthy and productive once again.

2. Restoration projects try to reintroduce plants and animals that once lived in a specific area. One successful project is in Illinois where prairies have been reintroduced, including the native animals, grasses, flowers, birds and insects.

3. Restoration can be extremely expensive and it requires that land be set aside for such a project. Some areas, such as forests, are extremely difficult to restore.

ENDANGERED SPECIES SOLUTIONS:

1. One of the ways used to preserve wildlife around the world has been to establish parks and reserves that humans cannot interfere with. Today, there are 3,500 areas around the world that are protected from destruction.

2. These parks and reserves are selected and maintained to provide an example of some of the world's environmental areas. However, many ecosystems are not represented and only a very small percentage of the world's land surface has been set aside for protection.

3. Most of the protected land consists of tundra and warm deserts but not tropical grasslands, evergreen forests and island systems.

ENDANGERED SPECIES SOLUTIONS:

1. Native people in every tropical forest region around the world have developed practices to preserve and manage their forests rather than destroying them.

2. In Mexico, the native peoples have tended forests of nut and fruit trees. These forests blend in so well with the surrounding rainforests that many people cannot tell when they are in a tended forest and when they are in an untended one.

3. This cultural knowledge of tending healthy forests could be taught to non-native people. Learning how to properly manage the tropical rainforests could spare trees and countless species.

ENDANGERED SPECIES SOLUTIONS:

1. Humankind is finding ways to protect the variety of lifeforms on the planet. The best way to preserve threatened species is to protect their natural habitats by turning them into parks or reserves.

2. Another way to protect diversity is to store gene pools in zoos, gardens, aquariums or gene banks. This can save *some* threatened species of plants and animals but many forms of wildlife do not thrive in such settings.

3. Scientists should also study more of the unnamed species of plants and animals to extend our understanding of their role on earth.

ENDANGERED SPECIES SOLUTIONS:

1. Each person can help reduce the demand for products that threaten the habitats of plants and animals by recycling. Recycling projects also reduce pollution that is harmful to human and plant and animal life. Recycling can be done at home, at school and in local communities.

2. One way to raise public awareness about the plight of endangered species is for a group to select one species to help. Projects to save that species can be publicized in local newspapers and on the radio.

3. One of the most important ways to help reduce the number of endangered species is for students to inform and educate others by word of mouth, letter writing, making posters and bumper stickers and staying informed about efforts to save wildlife.

5 Scavenger Hunt

Discovery: A Scavenger Hunt

A Scavenger Hunt is an exciting way to learn about any topic. Designed as a data collecting activity, it is a motivating way to encourage students to collect facts and information from a variety of sources. Many of the items collected or created will encourage students to think more deeply about their topics.

The intent of the Scavenger Hunt is to prepare students for the section on Researching Your Topic. The Scavenger Hunt also provides an abundance of information in a variety of ways—pictorials, maps, graphs, charts, models, dioramas, poems, tee-shirts, brochures, reports, and posters.

The materials gathered during this activity are valuable for the research section. They provide a good resource for quick information when students are problem-solving. Some of the items such as songs, charts, and murals may also be displayed or used in the final presentations on the last day of the Summit. If your Summit is going to be a school-wide or community event, these displays are an excellent way to inform others about the issues your class has studied.

Structuring a Scavenger Hunt

Introduce this activity by asking students if they have ever participated in a scavenger hunt. Explain that they will work together in teams to collect data or create as many of the projects on the Scavenger Hunt list as possible, within a given amount of time. If you would like this to be a competitive activity, the group that collects the most points may be declared the winner.

Divide your class into groups of approximately four students and pass out the Scavenger Hunt list. Tell the class they will have six days to gather information and create their products. On the seventh day, the points are tallied and the information is shared. It is recommended that some class time be initially provided so that groups may meet and work collectively on their projects.

After handing out the Scavenger Hunt information, give students 15 to 20 minutes to go over the list and plan a strategy. Stress the importance of developing a TEAM STRATEGY. Suggest that they decide what steps are needed to successfully complete the task. This might include assigning individual duties, establishing a timeline, and deciding their total point goal. Individual jobs might include record and tally keeper, researcher, artist, etc.

Students may also suggest additional projects, that do not appear on the Scavenger Hunt list. In this case, groups must get your permission and have you assign a point value before adding any new suggestions.

It is helpful to post each group's total point goal. As materials are brought in, they can be listed and tallied. This keeps a running total, provides a convenient way to check progress, and is a great motivator! It also shortens the final tallying process and allows for extra sharing time.

Within two or three days, your classroom may well be overflowing with data in a myriad of forms. Some teachers have used their hallways to display the information, indeed an effective way to share the wealth of facts your students have gathered.

On the seventh day, tally the data and provide class time for sharing the final projects. Point values can be assigned according to the quality of the product. If you deduct points, explain to students why and make suggestions for improvement.

Evaluation of the Activity

After the Scavenger Hunt is completed, pass out the Discovery Evaluation for each student to complete. Allow 10 to 15 minutes for groups to discuss each of the questions, then approximately 15 to 20 minutes for students to complete the evaluation individually.

The Discovery Evaluation responses will indicate the amount of knowledge gained in the hunt and will reveal any further questions the students may have. These questions can be posted and used to initiate the next activity, Researching Your Topic.

The Scavenger Hunt and Nothing But the Facts activities will motivate students to begin researching the complex problems associated with their global issue.

This activity was inspired by the "Cultural Studies Series—Teaching About Diversity: Latin America," University of Denver, Center for Teaching International Relations. The program uses a similar process for helping students learn about Latin America.

Endangered Species Discovery: A Scavenger Hunt

Thousands of animals throughout the world are faced with serious problems. Animals, in their struggle to survive, suffer from loss of habitat, overhunting, poisoning and pollution, or from having new species introduced by humans to a new habitat.

There are many things people can do to help wild animals in their struggle to survive. The most important action you can take is to learn and understand the problems faced by wildlife. This Scavenger Hunt will help you learn about many aspects of this complicated problem.

Rules for Scavenger Hunt

1. You must work in groups with each member contributing equally to the whole group effort.

2. You can go anywhere that is appropriate to obtain your data. Cameras and tape recorders may be used to record information. Written summaries of television shows, hand-drawn maps and diagrams are acceptable.

3. Use primary sources when possible.

4. The sources of all data must be recorded.

Items to Collect and Create

1. Make a map of the world showing the locations and types of animals that are endangered. Include marine animals. (10 points)

2. Collect 5 pictures of endangered plant or animal species. (5 points) BONUS: Add 10 points if you label your pictures and include 2 facts about each species.

3. Collect 2 articles from magazines that tell about efforts to save endangered animals. (5 points) BONUS: Add 10 points if you include a written summary of the article.

4. Create a chart that lists animals that have become extinct since 1900. Include when they disappeared and the cause of extinction. (15 points)

5. Choose one of the endangered species found in the United States from the list below and create a model of its habitat. Include labels and information cards that explain why this animal is endangered. (15 points)
    a. California Condor
    b. Mountain Lion
    c. Grizzly Bear
    d. Florida Panther
    e. Bald Eagle

6. Watch a television program about an endangered animal. Create a chart or poster that shares the information you learned from the T.V. show. (10 points) BONUS: 10 points for each additional show viewed.

7. Create drawings of four endangered plants. (10 points) BONUS: 10 points for including a written description for each.

8. Choose one of the endangered animals from the list below. Find out why this animal is endangered and write a poem or song about its struggle to survive. (20 points)
    a. Penguin
    b. African Elephant
    c. Giant Panda
    d. Black Rhinoceros
    e. Mountain Gorilla

9. Draw or collect pictures of endangered migratory birds. (10 points)

10. List animals from the different continents that are endangered. (10 points for each continent)

11. Choose one of the endangered animals from the list below and write a creative story about how that animal feels. Include the problems it is faced with and why it is threatened. Remember to research your animal first! (20 points)
    a. Polar Bear
    b. Alligator
    c. Wolf
    d. Harp Seal

12. Create a poster that tells about an endangered species of your choice that lists specific numbers and/or statistics about that species. (10 points)

13. Write a poem about how animals and humans can live together in peaceful co-existence. (15 points)

14. Create a mobile with pictures of animals that are endangered. (10 points)

15. Design a T-shirt that encourages people to help save the whales or another mammal of your choice that is currently endangered. (10 points)

16. Find out what different organizations are doing to protect wild plant and animal life. Write up a written summary about what each organization is doing to help save wildlife. Include an address and telephone number. (10 points for each organization listed)

17. Create a collage or mural that shows how the following four problem areas impact wildlife. (20 points)
    a. Destruction of Habitat
    b. Overhunting
    c. Pollution
    d. Introduction of a New Species

18. Many animals are hunted and killed illegally for their fur, horns, tusks, and other parts of their body. Find out what products come from rare animals. For example, elephants are killed for their tusks. Create a chart that lists the animal and the product(s). Include pictures where possible. (20 points)

19. Create a role play that includes plants, insects and mammals that are endangered. Act the role play out for your class. (20 points)

20. Find out how pollution is harmful to animal habitats. List the animal and the substance (oil, chemicals) that is harmful. Display your findings as a poster or chart. (10 points for each animal/substance listed)

21. Find out what zoos are doing to save endangered animals. List this information on a chart. Include the name of the zoo, the animal they are saving, and a brief description of the project. (10 points for each animal/zoo project listed)

22. For each of the following habitats, list at least four species that are endangered: (20 points)
    a. Tropical Forest
    b. Grasslands
    c. Desert
    d. Arctic Regions
    e. Ponds and Marshes

23. Make a map of the world showing wildlife refuges, preserves and protected land for animals. (20 points)

24. Create an endangered species alphabet book. List animals and plants that are endangered for each letter of the alphabet or use words related to endangered species. Include drawings and pictures where possible. (25 points)

25. Show how humans depend upon plant and animal wildlife. Include the contributions they make to maintaining a healthy ecosystem to the resources we use. Compile your findings into a chart. (15 points)

26. Find out about an animal or plant that is endangered in your local community or state. Create a pamphlet about why this animal or plant is threatened and what people can do to help save this wildlife. (20 points)

27. Create a mural that shows marine mammals currently threatened with extinction. (15 points) BONUS: Add 10 points if you include labels explaining why the mammal is under threat.

28. Write a description about CITES (Conservation on Trade in Endangered Species). Find out how many countries have signed the agreement since 1973 and what it has achieved to date in the conservation of wildlife and controlling wildlife trade. (20 points)

29. Organisms shape the environment. The air we breathe, the climate, soil and elemental cycles are all sustained by living organisms. Make a diagram or write a brief description for each of the following life support systems. (20 points)
    - Carbon Cycle
    - Water Cycle
    - Oxygen Cycle
    - Nitrogen Cycle
    - Sunlight Energy

30. Create your own items for the scavenger hunt on endangered species. Get your teacher's approval and together determine the number of points.

Evaluation Sheet for Discovery

NAME:______________________________DATE:________

TEAM MEMBERS:____________________________________

____

1. What information did you discover that indicates how critical this problem is?

2. What was the most interesting thing you discovered? Why?

3. Can you find two pieces of data that pose contradictory information about this problem? List the sources and the differences discovered and why you think they are in conflict.

4. Which item or activity gave you the most useful information? Why?

5. As a result of this Scavenger Hunt, what new action will you take to better understand and help solve this critical problem?

6. Describe the strategy used by your group to complete the Scavenger Hunt. How did it work? What would you do differently next time?

7. Did you experience any conflict in your group? Describe the conflict and how you did or did not resolve it.

8. What did you like best about this activity?

9. What would you change about this activity?

10. During the past week while working on the Endangered Species project I would like to thank ________________ for . . .

11. In order to relax right now, I would like to . . .

12. If I were evaluating my Endangered Species project work, I would say I have earned __________________ because . . .

13. If I were evaluating my group's Endangered Species project work, I would say we have earned _________________ because . . .

6 Map Activity

Where in the World? A Brief Geography Lesson

This activity will provide students with the opportunity to develop map-reading skills. Each student will need a small map of the world that includes longitude and latitude lines. You should have a large world map to demonstrate your explanations.

First, explain the concepts of longitude and latitude to the students. You might want to share the fact that these imaginary lines enable us to locate any point on earth. Latitude lines run around the world parallel to the equator. The equator has a latitude of 0 degrees. The North Pole has a latitude of 90 degrees north, sometimes shown as +90 degrees. The South Pole has a latitude of 90 degrees south, which is sometimes written -90 degrees. Ask students to locate the equator and the North and South Poles.

Longitude lines run north and south. Most nations count longitude east and west beginning with an imaginary line at Greenwich, England. Greenwich lies at 0 degrees longitude. A place halfway around the world from Greenwich is at 180 degrees longitude. The earth is divided into two hemispheres, each with 180 degrees. Longitude locations west of Greenwich are referred to as west longitude and those east of Greenwich have east longitude locations. Ask students to locate Greenwich and areas east and west of Greenwich as well.

Once students understand the concepts of longitude and latitude, ask them to look at their maps and find the longitude and latitude of major cities such as Los Angeles, New York, Miami, or Seattle. Have them look for a country and give the coordinates which the nation encompasses. When students are able to identify the correct meridians, they are ready to move on to the next activity.

Ask students to individually consider one place in the world where their global problem is especially severe. They could consider cities, countries, oceans, continents, etc. Instruct students that they are not to share with others where their trouble spot is located. When they have decided upon their global problem area, they then need to determine the latitude and longitude of this location. It is now time for geography riddles! Students will, one at a time, tell the class the longitude and latitude degrees of their particular spot. Class members are to locate these meridians on their maps and tell the name of the place. The student who has given the meridian points must validate the responses, and also must share the specific nature of the global problem at that location. You may also ask students to draw or note on their maps information they have learned to date. Additional data can be added as it accumulates.

Where in the World? A Brief Geography Lesson

This activity will acquaint you with map-reading skills. You will need a small map of the world that includes longitude and latitude meridians.

To read maps, you'll need to understand the concepts of longitude and latitude. These are helpful imaginary lines that enable us to locate any point on earth. Latitude lines run around the world parallel to the equator. The equator has a latitude of 0 degrees. The North Pole has a latitude of 90 degrees north, sometimes shown as +90 degrees. The South Pole has a latitude of 90 degrees south, which is sometimes written -90 degrees. Locate the equator and the North and South Poles on your map.

Longitude lines run north and south. Most nations count longitude east and longitude west, beginning with an imaginary line at Greenwich, England. Greenwich lies at 0 degrees longitude. A place halfway around the world from Greenwich is at 180 degrees longitude. The earth is divided into two hemispheres, each consisting of 180 degrees. Longitude locations west of Greenwich are referred to as west longitude and those east of Greenwich as east longitude. Locate Greenwich on your map. Identify some west and east longitude locations on your map.

To further practice the concepts of longitude and latitude, look at your map and find the longitude and latitude of major cities such as Los Angeles, New York, Miami, or Seattle. Look for a country and give the expanse of latitude and longitude meridans which the nation encompasses.

Next, consider one place in the world where a global problem is especially severe. You may want to consider cities, countries, oceans, continents, etc. Do not share with others where your trouble spot is located. When you have decided upon your global problem area, next determine the latitude and longitude of that location. It is now time for geography riddles! When it is your turn, tell the rest of the class the longitude and latitude degrees of your spot. Your class members are to locate the meridians on their maps and tell the name of the place you have chosen. You will need to validate their responses and also share the nature of the global problem at your location. Enjoy guessing your classmates' riddles as well.

7 Research and Independent Study

Self-Directed Learning: Researching a Global Issue

In the following activity, students have the opportunity to direct their own learning. Students will pursue a topic of personal interest, develop their own approach to research, and create their own project design. The intention of the self-directed activity is to let students assume responsibility for their learning. They will enjoy pursuing a topic of special interest to them while mastering independent learning skills, useful both within the classroom and without.

Students will progress through a five-step process. First, provide students with copies of Steps to Self-Directed Learning and the Independent Project Contract located on the following pages. Introduce each of the steps by having a brief class discussion to clarify and explain what is expected of them and also to address any questions they might have. You may want to brainstorm possibilities for study with the entire class. Students can refer to the list as a starting point when choosing their topics. You may also want students to keep their self-directed learning papers in some sort of file folder. The entire process can span from one to three weeks.

After completion of their independent research and in-class presentations, you may want to suggest that students share their knowledge with other classes, other schools, or create community forums. Or, you and your students may decide to wait for Step 2 of the Summit process to share their research in small groups.

To bring closure to this unit, you might ask your class what they have learned about being a creative and independent learner and how the skills used in this lesson can be applied to "everyday life."

Steps to Self-Directed Learning

Researching a Global Issue:

From your previous activities with the Fact Cards and the Scavenger Hunt, you have acquired a lot of information about your global topic. You will now have the opportunity to select one aspect of this topic that holds special concern for you. What have you encountered so far that was particularly interesting? Is there something more you would like to find out about?

STEP 1

So that you can independently direct your own learning, you will first need to decide upon your topic. Select one aspect of the global problem that intrigues you. You may instantly know what you would like to study or you may want to refer back to the Fact Cards or the Scavenger Hunt for ideas. Once you have determined your area of interest, narrow your topic down so that it is manageable to research. Get your teacher's approval before you begin Step 2.

STEP 2

To complete Step 2, you will need to make decisions about two important aspects of your project. First, determine at least three things that you want to learn. To do this, write your topic down on a piece of paper, then list a minimum of three items you are curious about. Perhaps you will want to answer the questions: **who, what, when, where** and **why** as they relate to the subject. Perhaps you have questions that spring to mind immediately. Once you begin researching, you may change your mind about some of the original questions you listed, or something else may appear intriguing. Do go ahead and pursue your new interests if this should occur. However, it's important to begin your research with a focus.

After you have written what you want to know about your topic, write a paragraph explaining what your final achievement will be. Perhaps you will create a model or a demonstration that will explain your subject. Be creative and develop an end product that will be fun and interesting for you to do, for example, make a model, write a song, do a collage, or make up a story or skit that includes factual information.

STEP 3

Once you have determined your topic and what you want to learn about it, you need to gather information. Data can come from books, but it can also be found in a variety of other sources. Your research will be enjoyable if you use many different approaches to gathering information. Identify three ways to gather data. You may want to choose from among the following, or create your own suggestions:

- Call a nearby university or other organization to determine if someone there is knowledgeable about your topic. If so, conduct a telephone interview. To do this, you will need to make a list of questions ahead of time so that you are fully prepared before speaking with the expert.

- Use your school or city library. Do not rely strictly on encyclopedias or books. Ask your librarian to help you locate governmental documents, films, videotapes, magazines, and newspapers that may contain information you need.

- Watch for pertinent television or radio shows. Check the educational television station in your area to find out what their programming includes.

- Your teacher can order films and videotapes on your topic from the educational service district nearest your school. You may want to request that either you or your instructor look through the film catalogue to determine what might be of value to your research.

- Conduct a survey at school or in your neighborhood where you ask people pertinent questions. Record their answers on a survey form that you create.

What are other suggestions you might have for finding the information you will need? Write on a piece of paper the three approaches you will use in your data collection.

STEP 4

Now that you have determined your topic and how you'll conduct your research, you are ready to complete an Independent Project Contract. This will provide both you and your teacher with an overview of your entire self-directed learning experience. Please complete the following form and have your teacher initial it. Enjoy learning independently!

Independent Project Contract

Student Name________________________________

Date____________________________________

Project ___________________________________

Title____________________________________

Planned Completion Date__________________________

Three items you will learn about your topic:

1.

2.

3.

Three information sources you will use:

1.

2.

3.

Final Product:

Project Timeline: List what you will accomplish and when:

Presentation: Describe what you will share with the rest of the class and when you will do the sharing:

Teacher initial: ________

STEP 5

After you have completed your in-class presentation, you can then evaluate the quality of your work. Your instructor will provide you with feedback as well. The following form can be used by both you and your teacher to determine what is done well and what is in need of improvement.

Evaluation of Self-Directed Learning Experience

Student name: ______________________________

Process Evaluation

1. Used time effectively in class:

1	2	3	4	5
Least time effective				Most time effective

Comments:

2. Used time effectively outside of class:

1	2	3	4	5
Least time effective				Most time effective

Comments:

Project Evaluation

1. Used a variety of different information sources:

1 2 3 4 5
One information source — Five or more information sources

Comments:

2. Completed project according to the project timeline:

1 2 3 4 5
Project not on target — Completed

Comments:

3. Showed effort:

1 2 3 4 5
No effort — Excellent effort

Comments:

4. Creativity:

A. Fluency (number of ideas)	1 2 3 4 5
B. Flexibility (different ways of sharing ideas)	1 2 3 4 5
C. Originality (uniqueness)	1 2 3 4 5
D. Elaboration (development of ideas)	1 2 3 4 5

Comments:

5. Other Comments:

8 Youth Summit

Overview of a Youth Summit

Once students have completed their research, they are ready to begin the Summit process. The Summit uses a problem-solving approach that encourages the use of creative and critical thinking skills. The particular model outlined for the Summit process is a synthesis of the work of E. Paul Torrance, Alex Osborne, and Bob Stanish. Some aspects have been adapted to fit the needs of the Summit.

The Summit is designed to encourage students to take action. It also serves to alleviate any frustration, anxiety, and/or fear that may have built up as a result of the in-depth research done in the previous activities.

By going through the Summit process, students will develop the skills inherent to effective problem solving. The process stretches students to engage in higher cognitive functioning, to learn to work effectively in groups, and to improve their communication and writing skills. Most important, it moves students from the level of theory to the level of practical application.

Structuring a Youth Summit:

Time

The entire process, including the final presentations, will take approximately 8 to 12 hours. This can be structured as a Summit or it can be extended over a week-long period. We recommend a two- to three-day Summit to focus student interests and to provide uninterrupted time for concentrated exploration. However, this is not always possible. Conducting the Summit over a one-week period can work well, especially if you provide time to review the previous day's work and facilitate closure at the end of each working period.

Materials

We recommend that each student be provided with a copy of the Summit Journal. This outlines the problem-solving process and provides a place for your class to record their efforts. This becomes a valuable evaluation tool and should be checked at various intervals throughout the Summit. Additional materials include butcher paper and colored marking pens. Art supplies and reference materials should also be available.

Establishing Problem-Solving Groups

We recommend groups of four to five students. If cooperative learning is new to your students, you might consider setting up groups of three. The grouping works best if it is heterogeneous in terms of ability and talents. You may want to have students work in the same groups as were arranged for the Scavenger Hunt activity.

Work/Display Area

If you are holding the Summit in your classroom, establish work/display areas for each group. Tables work best; however, desks can be put in a circle or square. If possible, provide wall and counter space so that students may display the information gathered during the Scavenger Hunt and Self-Directed Learning. Students will also be displaying information generated during the problem-solving process. You may want to establish one main resource area where books, pamphlets, posters, and articles may be stored for easy access throughout the Summit.

Problem-Solving Process

You will want to familiarize students with the problem-solving process before the Summit. See the next section, Facilitator's Guide, for more detailed information. For easy reference, we have included an agenda with approximate times.

Introduce each step to the entire class, and then have the students begin the process. Establish a time limit, then add more time if needed. Some groups may work through the process faster than others. You can give them instructions for going on to the next step.

As students work through the process, move from one group to the next to observe interaction. Clarify the process when necessary, help resolve group conflicts if they arise, and provide needed information or directions for finding it.

Preparing Presentations

At the onset of the Summit, explain to students that each group will be responsible for planning a 10- to 15-minute presentation for the class. This presentation will focus on informing others of the problem they have worked on and their proposed solutions. Students should start thinking about this at the onset. They are encouraged to be creative in the manner with which they present their material. Encourage them to use charts, graphs, illustrations, pictures, skits, poems, songs, dances, or stories to teach the others. They might also consider ways to get their classmates involved in helping them carry out their solutions.

At the conclusion of each presentation, allow time for questions or suggestions from the audience. This period can take up to three hours depending upon the number of groups sharing and the length of the presentations. Group presentations often range from five to twenty minutes.

You may also decide that your students should share their work with other classrooms, schools, parents, and/or community members. To manage this step, ask students to submit an outline of their project for your approval. Also, students will need time to rehearse. Much of the materials produced during the Scavenger Hunt can serve as visual displays; however, some groups may need additional time to develop props, costumes, charts, and hand-outs.

Taking Action

This is the most exciting part of the process. Here students take action and begin effecting change. It may be necessary to set aside time each week for students to work on their action plans. There are a myriad of possibilities for taking action and you may find your class involved in creating a game, making a film, writing a book, starting a newsletter, raising money for a project, conducting research, getting signatures for a petition, surveying the community, or making public service announcements for a local television station, to name a few of the possible outcomes.

NOTE: The processes and times shown on the following page are merely suggestions. You are encouraged to make adaptations to fit your needs and classroom situations.

Our Only Earth

Youth Summit Agenda

(Suggested Times)

STEP 1 — Introduction/Problem Exploration (30 minutes)

STEP 2 — Sharing Research (1 - 1.5 hours)

STEP 3 — Brainstorming Problems (30 minutes to one hour)

STEP 4 — Brainstorming Solutions (30 minutes to one hour)

STEP 5 — Evaluating Solutions (1 - 1.5 hours)

STEP 6 — Carrying Out Solutions (1 - 1.5 hours)

STEP 7 — Presenting Solutions (1 - 3 hours)

Facilitator's Guide: Youth Summit Process

STEP 1—Introduction/ Problem Exploration

GOAL: To share feelings, thoughts, and ideas surrounding the global issue.

OBJECTIVES: To communicate feelings, thoughts, and ideas concerning the issues surrounding the problem.

TIME: Approximately 30 minutes.

PROCESS: Begin by introducing the problem-solving process to be used throughout the Summit. It is helpful to go over each of the seven steps. Students can follow along in their Summit Journal, which serves as a guide as well as a place to record their progress. These journals are also helpful in evaluating students' work.

(OPTIONAL): Depending upon the age and experience of your class, you may want to practice the problem-solving process with a problem that students are currently trying to resolve, i.e., improving grades or saving money. This trial run will familiarize students with the key components of effective problem-solving and usually takes about one hour of class time.

No matter how you introduce the problem-solving process, emphasize the need for students to work together in a cooperative and collaborative manner. For information on implementing cooperative learning in the classroom, refer to the work of Roger T. Johnson and David W. Johnson. Their books are helpful in structuring cooperative learning in the classroom: *Learning Together and Alone, Circles of Learning*.

Once students are familiar with the Summit process, initiate Step 1 by having them record their individual reflections on their particular global issue. Ask them to write in their Journals any feelings, thoughts, ideas, images, and/or fears about this issue.

After students have an opportunity to reflect, allow time for sharing with members in their groups. You may also want to provide time for a classroom discussion. If so, have each group choose someone to summarize their discussion for the benefit of the whole group. Remind students that each time information is shared with the whole group, a new spokesperson will be selected. Encourage students to record any new bits of information, key ideas, or insights that emerge during the sharing.

STEP 2—Sharing Research

GOAL: To learn from others about the issue.

OBJECTIVES:

- Share research information.
- Categorize key ideas generated by the group.
- List any unanswered questions.
- Develop strategies for discovering answers to any unanswered questions.

TIME: 1 - 1.5 hours.

PROCESS: In this step, students share their independent research, completed in the previous activity (self-directed learning), with members of their problem-solving groups. After the presentations and sharing of research, have students categorize key ideas and information on a Data Retrieval Chart. An example is given below. Have students make their own chart on a large piece of butcher paper. This information can be posted in the group's work area.

Sample Data Retrieval Chart

Name	Who	What	When	Where	Why

To complete the Data Retrieval Chart, each student summarizes and inserts the information in the appropriate categories. They begin by each placing their name in the correct column and then completing one horizontal section of the chart. Each student, then, should contribute a who, what, when, where, and why fact to the chart. The completed chart organizes and categorizes facts and information for easy reference during the Summit process.

Once students have shared their Independent Research Projects and have filled out the Data Retrieval Chart, you may want to allow time for each of the problem-solving groups to share their data and information with the entire class. Have problem-solving groups designate a NEW spokesperson.

As each group reports information, ask the other groups to indicate if they have listed similiar information. If so, they should mark this information so that it is not repeated again, but simply acknowledged. Groups are encouraged to add to their Data Retrieval Charts as new information emerges.

An additional use for the Data Retrieval Chart is to have students consider their global issue from diverse viewpoints. Students can first suggest a variety of individuals or organizations involved in their issue. For example, an issue might be the loss of habitat for the Monarch butterfly in the tropical rainforest. Some of the people involved could include contractors who are building through the forest, local people who are cutting the forest to create space for homes and cattle ranching, the Cuna Indians who have learned ways to manage the forest without destroying it and its wildlife, scientists who are concerned about massive species extinction due to tropical deforestation, bankers who are funding development projects in the tropics, and Greenpeace workers who claim they will boycott tropical rainforest products if more habitat destruction occurs. Each student could think of one group to list under the "name" section of the grid. Students can then add each group's perspective as they complete the who, what, when, where, why portions of the chart. Discussion can follow the sharing of the new perspectives involved. Point out to the students that there are always two or more sides to each issue.

STEP 3—Brainstorming Problems

GOAL: To brainstorm problems related to the issue.

OBJECTIVE:

- Identify specific problems by brainstorming sub-problems and contingent problems related to the situation.
- View the problems from a variety of perspectives.
- Choose a problem to solve.
- Define the problem.

TIME: Approximately 30 minutes to one hour.

PROCESS: Identifying the problems related to this global issue is one of the most important steps of the creative problem-solving process. Defining the problem properly will determine the quality and appropriateness of the students' solutions.

Introduce this step by emphasizing the importance of problem identification. Remind students that in identifying problems associated with this issue, it is important to view the problem from all angles. It is helpful to think about how people, nations, plants and animals are affected by this issue. Ask students to consider issues from different points of view.

Next, ask small groups to think about all of the problems related to the issue. Familiarize students with the rules of brainstorming, stressing the importance of withholding judgement, "piggybacking" on others' ideas, and freewheeling. Allow the groups approximately 15 to 20 minutes to brainstorm.

Afterwards, suggest that groups review the list of problems they generated. At this point, some problems may be combined or elaborated, as well as new ones listed.

Allow time for small groups to decide which of the listed problems they are most interested in solving. Once each group has chosen a problem, they are ready to move on to problem definition.

To define the problem, students need to think of different ways to state the problem. It is sometimes easier to generate solutions when the problem is posed as a question rather than a statement. Ask students to think carefully about the verb they use in their definition. A strong verb will focus their energies. An example might be: How can we decrease the number of elephants being killed for their tusks? Or: How can we increase the awareness of our local community about the loss of local plant species? Have students experiment with the use of different verbs when selecting their questions and ask them to answer the questions in this section of their Summit Journal. They will undoubtedly note that as they change their definition, the focus for solutions will also change.

As each group defines their problem, move about from group to group, checking for strong verb usage and making sure they are on the right track.

Once students have completed the task, allow time for reviewing information and facts, keeping in mind the specific problem they have chosen. New questions may arise, and students may find they need more information before they can generate solutions. If so, groups should plan a strategy for gathering new information. Depending on how many groups need to do more research, you may want to allow additional classroom time or have students complete the research as homework.

STEP 4—Brainstorming Solutions

GOAL: To brainstorm creative solutions to the problem.

OBJECTIVES:

- Apply the brainstorming process for generating solutions.
- Generate many ideas, simple or complex.

TIME: Approximately 30 minutes to one hour.

PROCESS: Provide problem-solving groups with approximately 20 minutes to discuss possible solutions. Remind students that the goal of brainstorming is to generate as many ideas as possible. Emphasize the importance of withholding judgment while deliberating. For now, they can let their creativity soar; wild and crazy ideas are acceptable. One of those ideas, after a little revision, just might be the solution they are looking for. Remind students not to overlook simple ideas; solutions can range from simple to complex, and sometimes the simplest solutions are the best! Encourage students to combine solutions or add onto the ideas of others.

As students come up with ideas, have them say their plans aloud while at the same time writing them down on scrap paper. Place all pieces of paper in the center of the group, to use in Step 5. Students may also want to record their ideas in their Summit Journals. Allow additional time if groups are still brainstorming after 20 minutes.

STEP 5—Evaluating Solutions

GOAL: To decide which solutions might be the best for solving the stated problem.

OBJECTIVE:

- Decide on the top two ideas.
- Evaluate possible positive and negative outcomes.
- Evaluate possible long- and short-term consequences.
- Evaluate solutions and make a final determination regarding the "best" solution.

TIME: 1 - 1.5 hours.

PROCESS: Provide small groups with about 10 minutes to decide on the top two solutions. These solutions should be listed in order on the Evaluation Grid located in their Summit Journal and shown below.

Youth Summit Solution Evaluation Process

SOLUTIONS: Rank in order your top 2 solutions and list	**POSITIVE OUTCOMES +** List 3 positive outcomes for each solution	**NEGATIVE OUTCOMES -** List 3 negative outcomes for each solution	**POSSIBLE SHORT- & LONG-TERM CONSEQUENCES:** List the consequences that might result from the implementation of your solutions in a 1-, 5-, 10-, and 20-year time frame. Put a + or - by each consequence to signify whether it is positive or negative.			
SOLUTION #1:			**1 YEAR**	**5 YEARS**	**10 YEARS**	**20 YEARS**
SOLUTION #2:						

GROUP TOPIC:

GROUP MEMBERS:

SPECIFIC GROUP CHALLENGE:

Once the top solutions have been selected, students begin the evaluation process. For each solution listed, students will go through the following three steps:

- POSITIVE OUTCOMES — Students list four or five of the possible positive outcomes. Positive outcomes should be considered from various points of view.
- NEGATIVE OUTCOMES — Students list four or five of the possible negative outcomes. This can be looked at from the different points of view examined in step one if applicable.
- POSSIBLE SHORT & LONG TERM CONSEQUENCES— In this step, students forecast the possible consequences that might result from the implementation of their solutions over a 1-, 5-, 10-, and 20-year time frame. For each consequence, students should put a + or - to signify a positive or negative consequence.

Once students have completed the evaluation process, have problem-solving groups decide which is the best solution in light of the positive and negative outcomes, including the possible short- and long-term consequences.

Suggest that small groups discuss their final solution. Encourage them to ask if the solution clearly reflects the thinking of the entire group. Changes might also now become apparent. Students may need to modify their solutions based upon the possible outcomes and consequences. Have students answer the questions on Modifying Your Solution in their Summit Journals.

STEP 6—Carrying Out Solutions

GOAL: To develop an action plan for carrying out the solution.

OBJECTIVES:

- Brainstorm different ways to carry out the solution.
- Create a step-by-step plan for carrying out the solution.
- Brainstorm ways to inform others about this problem and suggested solutions.

TIME: 1 - 1.5 hours.

PROCESS: Thomas Edison once said that creative work is "... one percent inspiration and ninety-nine percent perspiration." Remind students that this is the most important part of their work. Here, their creativity will be taxed as they discover ways to carry out their solutions. While this step demands much work, it is also the most gratifying part of the process since students become empowered to take action.

Remind students that a good part of their efforts will include informing people about the problem and their proposed solutions. This can be done through a variety of ways including songs, artwork, poems, stories, plays, newspaper articles, petitions, letter writing, and editorials.

This is also the time when students generate various ways to apply their theories. These might include a letter-writing campaign, adopting a concern, or developing an organization that informs other youth about this problem and what they can do.

Fund raising is another possible project. The funds can even be used to support students' projects and concerns. It's an excellent way to inform others as well as a practical way for students to see their work in action. You might want to spend time brainstorming possible fund raising options as a whole group. Suggestions include: raffles, selling students' art work, information booths at local and community events, car washes, and/or bake sales.

At past Summits, students have generated a wide variety of projects. These include: making a game about the effects of plastics on the environment, writing a book about the issues surrounding tropical deforestation with solutions from students around the world, creating a worldwide network of youth interested in working together to save the tropical rainforests, writing letters to congressmen, setting up a booth at a local carnival to inform individuals about the ocean crisis, creating a public service announcement, and making short films to inform people about wildlife's struggle to survive.

Once small groups have their ideas, allow 20 to 30 minutes for developing their Group/Individual Action Plans. These are included in the Summit Journals and should be completed by each student. These action plans require students to list each of the steps they need to take in order to carry out their solutions, as well as to identify the person responsible for each part of the action plan. Students will also create a timeline to indicate when they anticipate the completion of each step. Finally, students are able to reflect on what the end results of their efforts might be. This is cause for celebration!

Examples of the forms that the students will complete for Step 6 follow on the next two pages:

Action Planning

You will now need to organize how to carry out your group's solution. Each of you will have individual tasks to complete. On the form below, write down your group action plan.

Youth Summit Group Action Plan Form

Group Topic: ______________________________

Group Members: (Please list first and last names.)

Describe the specific problem your group decided to solve:

List your best solution:

List the specific steps your group will take to carry out the solution, beginning with what you will do **first, second, third,** and so on. Also list the name of the group member who will be responsible for doing each step:

Create a timeline stating dates of completion for the steps listed above:

Describe the end result of your efforts. What exactly will you have accomplished?

Individual Commitment

On the following form, state the responsibilities you took on as part of your personal contribution toward solving a global problem.

Youth Summit Statement of Individual Commitment to Work on an Area of Global Concern

Name: ____

Area of Global Concern:

List the commitments you made to your group at the Summit:

Please describe below any additional commitments you would like to make and pursue independently:

Signature: ______________________________ Date: ______

Thank you for your efforts to make the world a better place!

STEP 7—Presenting Solutions

GOAL: To develop presentations that inform others about the issue and the plan of action.

OBJECTIVES:

- Suggest various ways to present information and solutions.
- Teach at least 10 facts to the audience.
- Actively engage the audience in learning about the issue and in taking action.

TIME: 1 - 3 hours.

PROCESS: Allow time for students to present information about the problem and their solutions to the class. Students might use some of the products from the Scavenger Hunt or Independent Research to teach others about the problem. Encourage the use of charts, diagrams and illustrations. Poetry, songs, raps, or skits can also be a great way to inform others. Emphasize the need to develop dynamic and interesting presentations that encourage audience participation.

To help the students prepare a presentation, the following three steps are included in their Summit Journals:

Step 1: Determine how you will inform the audience about your group's specific problem. What will you say or do to begin your presentation and how will you explain the issue you have addressed?

Step 2: Outline below how you plan to describe your solution and action plan to the audience. Select at least two of the strategies listed below to include in your presentation.

Presentation Stategies:

- charts, graphs, tables
- posters
- illustrations, photographs
- cartoons
- poems, songs, raps
- skits, plays, simulations
- data sheets
- booklets, pamphlets, handouts
- overhead transparencies
- slides, video, music
- audience participation

Outline of your solution and action plan:

Step 3: If appropriate, how can your group engage the support of the audience in implementing your solution? List ways that your group could involve community members, business and industry, local schools, parents, and organizations that might give support. Prepare to share this as part of your presentation.

After the students have prepared their presentations, they may want to go "on the road" with them. Exhibits can be set up in the school or public library so other students can see them. Talk to your principal about holding a school-wide assembly. There may be other students who want to get involved in the activities. A Parent Night or Community Night could be set up to inform others, not only about the issues, but also about what students have been doing to resolve them.

In Conclusion:

The actual implementation of solutions may be a year long, or longer, process for some of your students. You may find that your class will be involved throughout the school year. You may wonder how you could possibly take any more classroom time for this issue. However, many of the activities can be integrated with other areas. For example, writing will undoubtedly be an activity that all groups will participate in. Public speaking can also be incorporated into the solution-finding process. Students may get involved with state lawmakers and learn about the legislative process or they may conduct scientific research through local zoos, water protection agencies, or universities. Posters and art work might be developed as a visual means of communicating information. Likewise, students may want to write a song, perform a play or choreograph a dance relating to their topic. They may also wish to survey pertinent people or obtain feedback on their proposed solutions.

The possibilities for integrating this material into all content areas are limitless. But more importantly, we have found that through this "real life" content and the process of problem-solving and actually implementing solutions, students become highly motivated toward learning in general. In addition, students are more creative and willing to take risks. Even the unmotivated learner begins to shine as he/she is able to independently take responsibility for learning. Parents report that their children have begun reading newspapers and watching educational television. Students become more involved in school, in the community, and in the world. And most importantly, they recognize their place as caretakers of one another and of the planet.

It is imperative that the next generation have the skill and ability to effectively deal with the global challenges that will face them. The purpose of this series is to instill in students an awareness of the importance of taking action that will have a long-term, beneficial effect on the entire planet. As problems become more and more common, it is hoped that the next generation will have the sensitivity, the skills, and the desire to solve them. Our future, and our children's future, truly depend on what happens today.

Our Only Earth
SUMMIT JOURNAL

Endangered Species:
Their Struggle to Survive

Introduction

A creative problem-solving process will be used to structure your efforts towards finding and then implementing solutions to your global challenge. This process provides a way to capture your dreams and hopes by putting them in a practical form that enables you to make positive contributions to your community and the world community, today and in the future.

STEP 1—Problem Exploration

Reflect for a moment on the many things you have learned about your global issue. Also reflect on how that information made you feel. Did you feel frightened or overwhelmed from the scope of the problem? Do you have concern for the well-being of others? In the space provided below, write down your feelings and thoughts about this issue. Include images, ideas, fears, or anything else associated with the problem.

In small groups, discuss your feelings and thoughts surrounding this issue. Note how your feelings are similar to, or different from, other members' in the group. Be prepared to summarize your group discussion for the benefit of the whole class. Choose a spokesperson.

Record the key ideas of your group on the back of this page or on a new sheet of paper. During the discussion, add any new bits of information to your list.

STEP 2—Sharing Research

Each group member will be asked to describe to the others his/her independent research project. Use the Data Retrieval Chart (see sample below) to categorize the information you have learned as a result of the presentations. Each member's name should be listed in the Name column, and then for each person the **who, what, when, where** and **why** facts from their work. Also keep records of any new questions that come up. Discuss ways to find the answers and assign responsibilities. Choose a new spokesperson to present your Data Retrieval Chart to the entire class.

DATA RETRIEVAL CHART

Name	Who	What	When	Where	Why

STEP 3—Brainstorming Problems

Step 3 has two aspects: the first is to identify the many problems associated with your issue and the second is to define the specific problem which your group decides to address. By identifying the problems surrounding the issue, the proper definition can be determined, which influences the quality and appropriateness of your solutions.

In your group, brainstorm the problems related to your global issue. List your ideas below.

Now go back and review your list. What problems go together? Cross out any problems that are repeated. Add new ones that may come up as you review the list. As a group, decide which problem to solve.

BRAINSTORMING PROBLEMS (con't)

Problem Definition

One of the ways to clarify a problem is to phrase it as a question. Restating your problem as a question will make it clear and definite. This will also direct you to possible solutions. For example, if your issue is the disposal of waste products in your city, several questions could be formulated, such as:

- How can we educate our community about its waste disposal problem?
- In what ways could we reduce the amount of waste our community generates?
- How can we limit the amount of disposable products used in our community?
- What kind of recycling program could we create locally?

There could be many other questions as well. As you can see by restating your problem as a question, the focus becomes more clear and you may be better prepared to seek answers. These answers will later suggest solutions which will lead you to a specific group project. For now, however, the task is to take your issue and turn it into a question. On the space provided below, write your group's issue:

____

Working individually, take a couple of minutes to come up with two or three possible questions. You will want to include a strong action-oriented word in each of your questions such as any of the following:

educate
limit
decrease
reduce
inform
involve
enhance
promote
publicize

Write two or three questions that restate your issue on the following lines. Choose one of the action words above, or better yet, generate some of your own for each question you create. Circle the strong action word in each question:

1. ____

____

2. ____

____

3. ____

____

Next, share the questions with your group. Choose one which is most fitting and write it below:

Problem Question: ______________________________

____

Before beginning STEP 4 — Brainstorming Solutions, review the information you have gathered. Determine what new information you might need in order to solve this particular problem.

STEP 4—Brainstorming Solutions

List the solutions generated by your group discussion in the space below:

STEP 5—Evaluating Solutions

In this step, you decide which solutions might be most appropriate for solving the problem. To evaluate your solutions use the EVALUATION PROCESS FORM located on the next page. Decide on the top two solutions. Once you have used the EVALUATION GRID to determine your best solutions, discuss your results with the group to make sure that everyone agrees that this is the best solution.

Youth Summit Solution Evaluation Process

SOLUTIONS: Rank in order your top 2 solutions and list	**POSITIVE OUTCOMES +** List 3 positive outcomes for each solution	**NEGATIVE OUTCOMES -** List 3 negative outcomes for each solution	**POSSIBLE SHORT- & LONG-TERM CONSEQUENCES:** List the consequences that might result from the implementation of your solutions in a 1-, 5-, 10-, and 20-year time frame. Put a + or - by each consequence to signify whether it is positive or negative.			
SOLUTION #1:			**1 YEAR**	**5 YEARS**	**10 YEARS**	**20 YEARS**
SOLUTION #2:						

GROUP TOPIC:

GROUP MEMBERS:

SPECIFIC GROUP CHALLENGE:

Modifying Solutions

Once your group has determined the best solution to your issue, some modifications may be necessary. You may need to adjust your solution so that potential negative outcomes can be limited. To decide if you need to adjust your solution, answer the following questions:

1. What were some negative outcomes that could result from implementing your solution?

2. How could you avoid these negative possibilities?

3. Were there any possible negative short or long term consequences? If so, list these below.

4. Based upon the information to the above questions, how could you adjust your solution to minimize potential negative outcomes or consequences?

5. Write out your modified solution in the space provided below:

Congratulations! You should now have a well thought out solution to your group's selected problem.

STEP 6—Action Planning

You will now need to organize how to carry out your group's solution. Each of you will have individual tasks to complete. On the form below, write down your group action plan.

Youth Summit Group Action Plan Form

Group Topic:______________________________

Group Members: (Please list first and last names.)

Describe the specific problem your group decided to solve:

List your best solution:

List the specific steps your group will take to carry out the solution, beginning with what you will do **first, second, third,** and so on. Also list the name of the group member who will be responsible for doing each step:

Create a timeline stating dates of completion for the steps listed above:

Describe the end result of your efforts. What exactly will you have accomplished?

Individual Commitment

On the following form, state the responsibilities you took on as part of your personal contribution toward solving a global problem.

Youth Summit Statement of Individual Commitment to Work on an Area of Global Concern

Name: ______________________________

Area of Global Concern:

List the commitments you made to your group at the Summit:

Please describe below any additional commitments you would like to make and pursue independently:

Signature: ______________________________ Date: ________

Thank you for your efforts to make the world a better place!

STEP 7—Presenting Group Solutions

Now that your group has determined a solution and an action plan, the next step in the Youth Summit process is to develop a presentation to inform others of your efforts. Your group should create a 5- to 15-minute presentation. To help organize your ideas, follow the steps below:

Step 1: Determine how you will inform the audience about your group's specific problem. What will you say or do to begin your presentation and how will you explain the issue?

Step 2: Outline below how you plan to describe your solution and action plan to the audience. Select at least two of the strategies listed below to include in your presentation.

Presentation Strategies:

- charts, graphs, tables
- posters
- illustrations, photographs
- cartoons
- poems, songs, raps
- skits, plays, simulations
- data sheets
- booklets, pamphlets, handouts
- overhead transparencies
- slides, video, music
- audience participation

Outline of your solution and the action plan portion of your presentation:

Step 3: If appropriate, how can your group engage the support of the audience in implementing your solution? List ways that your group could involve community members, business and industry, local schools, parents, and organizations who might give support. Prepare to share this as part of your presentation.

Summit Notes

Use this space to record information presented by the other groups. Be ready to write down what you can do to help solve the various problems presented.

Glossary

biological diversity: the variety of plant, insect and animal species living on earth.

carbon dioxide: a heavy, colorless gas that is formed by the combustion and decomposition of organic substances. Carbon dioxide is absorbed from the air by plants in photosynthesis.

conservation: protection of natural resources from waste or harm.

deforestation: the process of clearing forests through cutting or burning.

ecosystem: a community and its environment that functions as an ecological unit in nature.

endangered: threatened with extinction. The black rhino is on the official list of *endangered* species.

extinction: no longer existing; dead.

gene pool: the total genetic information of all individuals in a given population.

geophysical: having to do with ocean, volcanic, weather or other natural processes.

habitat: the place where an animal or plant naturally grows.

habitat destruction: when the place where an animal or plant naturally grows is destroyed through human activities or climatic/ geophysical changes, such as a volcanic eruption.

hectare: approximately 2.47 acres.

interdependent: when two or more lifeforms are unable to exist or function satisfactorily without the other.

photosynthesis: a process in which plants convert carbon dioxide into water and sugar.

poaching: illegal hunting.

pollinator: one who transfers pollen from one source to another.

restoration: the act of putting something back into its original place or condition.

siltation: to fill up or choke with silt, a material about the consistency of sand.

species: fundamental biological classification, consisting of a number of plants or animals which have a high degree of similarity.

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Mary Ellen Sweeney, Editor
Holistic Education Review Journal

About the Authors:

Micki McKisson has an extensive background in education. She has been an educational consultant for many years, a workshop facilitator and adjunct professor for Seattle Pacific University.

Micki has experience in coordinating and teaching a variety of educational programs involving U.S. and Brazilian students in Rio de Janeiro; working with youth at risk during five years of summer programs; and, for six years, teaching in the Gifted Education Program in Issaquah school district.

Currently, Micki works with Greenpeace International as North American Project Coordinator for the East/West Educational Project. She is also responsible for field-testing the Greenpeace curriculum in North America, Europe, and the Soviet Union.

Micki has a BA in Psychology and an MA in Systems Design—Education. Her previous book is titled *Chrysalis: Nurturing Creative and Independent Thought in Children.*

* * *

Linda MacRae-Campbell has a long and impressive track record in the field of education. For fifteen years, Linda taught grades K-12, and during that time was a three-time winner of the Teacher of the Year Award.

Her experience in education ranges from classroom teaching to such accomplishments as directing gifted, special ed., and arts programs for children; consulting for a variety of educational institutions; training teachers world wide and directing an international educational network in Seattle called New Horizons for Learning.

Linda is a nationally recognized expert in innovative educational research; she has given over one hundred presentations in the last three years.

Presently, she spends time, in addition to persuing a doctorate in education, as coordinator of a new model of teacher certification for Antioch University in Seattle, Washington.

* * *

Together, Micki and Linda have developed and conducted the world's first Youth Summit in Moscow, where 200 Soviet and American youths worked together writing the Youth Declaration for the Future. They have also collaborated on teacher education programs for educators in Guatemala.

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